



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,537	12/19/2003	Gary A. KNEEZEL	117003	1536
27074	7590	10/03/2007	EXAMINER	
OLIFF & BERRIDGE, PLC. P.O. BOX 19928 ALEXANDRIA, VA 22320			ARANCIBIA, MAUREEN GRAMAGLIA	
			ART UNIT	PAPER NUMBER
			1763	
			NOTIFICATION DATE	DELIVERY MODE
			10/03/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction27074@oliff.com
jarmstrong@oliff.com

Office Action Summary	Application No. 10/707,537	Applicant(s) KNEEZEL, GARY A.	
	Examiner Maureen G. Arancibia	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
 and for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2007 and 17 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 20-31 is/are pending in the application.
- 4a) Of the above claim(s) 4-8, 23-27, and 31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 20-22 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Application/Control Number: 10/707,537

Page 3

Art Unit: 1763

passages be formed using an orientation-dependent etching technique. (Figures 2 and 3; Specification, Paragraphs 40-41) This limitation of Claims 21, 22, 29, and 30 will be examined. The recited limitation of forming the passages by reactive ion etching corresponds to non-elected Species B, and will not be examined at this time. Moreover, for future reference, the Examiner notes that the recited limitation of a non orientation-dependent etching technique (which will not be examined at this time) does not appear to have support in the Specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1-3, 20-22, and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,938,923 to Tu et al. in view of Japanese Kokai 06-183002A to Hosogai et al. The following rejection refers to the Figures and English Machine Translation (EMT) of Hosogai et al.**

In regards to Claims 1, 2, 20, 21, 28, and 29, Tu et al. teaches a method of manufacturing an internal filter (shown in Figures 5 and 6B), comprising: providing a first substrate 103; providing a second substrate 101; forming a plurality of first passages 110 in the first substrate using an orientation-dependent etching technique (by etching the silicon substrate using KOH; Column 6, Line 66 - Column 7, Line 4; Column 7, Lines 47-53); forming a plurality of second passages 112 in the first substrate using an

Application/Control Number: 10/707,537

Page 2

Art Unit: 1763

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 21 June 2007 and 17 July 2007 have been entered.

Election/Restrictions

2. Newly presented claims 23-27 and 31, like previously presented claims 4-8, are drawn to non-elected species, and will therefore Claims 23-27 and 31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 19 January 2006.
3. The Examiner notes in regards to newly presented Claims 20 and 28, as was previously noted in regards to Claim 1, that the elected Species A requires that the first and second passages be formed in the first substrate, and the third passages be formed in the second substrate. This limitation of Claims 20 and 28 will be examined. The recited limitation of alternately forming the third passages in the first substrate corresponds to non-elected Species E and F. The Examiner notes in regards to newly presented Claims 21, 22, 29, and 30, as was previously noted in regards to Claims 2 and 3, that the elected Species A further requires that the first, second, and third

Art Unit: 1763

orientation-dependent etching technique (by etching the silicon substrate using KOH; Column 6, Line 66 - Column 7, Line 4; Column 7, Lines 47-53) such that the first passages 110 are interleaved with the second passages 112 (Figure 6B); forming (Column 6, Line 66 - Column 7; Column 7, Line 62 - Column 8, Line 13) a plurality of third passages (channel 113 is subdivided into a plurality of third passages by anchor points 114; see Figures 5 and 6B); and placing the first and second substrates adjacent to each other (ex. Figure 5; Column 10, Lines 32-33), such that the plurality of third passages extend between and directly connect to the first passages and second passages and fluidly connect the first and second passages, wherein every fluidic connection between a first passage 110 and a second passage 112 comprises two or more third passages (see arrows in Figure 6B indicating the plurality of third passages between anchor points 114), wherein particles having a size greater than that which can pass through the third passages are filtered from the fluid when the fluid flows through the first passages, into and through the third passages, and into the second passages (Figure 6B; see also at least Column 5, Line 61 - Column 6, Line 24), and wherein the internal filter comprises the plurality of first passages, the plurality of second passages, and the plurality of third passages (Figures 5 and 6B).

Further in regards to Claims 1, 20, and 28, Tu et al. teaches that the third passages are formed in the first substrate. (Figure 5)

Tu et al. does not expressly teach that the third passages can be formed in the second substrate, as required by elected Species A.

Art Unit: 1763

Hosogai et al. teaches an alternative method for forming a plurality of third passages 8 (*bypass pit 8 corresponding to each nozzle*) that are formed to extend between and fluidly connect a plurality of first passages 2 (*individual reservoirs*) and a plurality of second passages 1 (*nozzles*), wherein the plurality of first passages 2 and the plurality of second passages 1 are formed in a first substrate 6 and the plurality of third passages 8 are formed in a second substrate 5 (*in top layer 10*). (Figures 1 and 9; EMT, Paragraphs 2 and 12-15)

Because both Tu et al. and Hosogai et al. teach methods for forming a plurality of third passages that are formed to extend between and fluidly connect a plurality of first passages and a plurality of second passages, it would have been obvious to one of ordinary skill in the art to substitute one method for the other, i.e. to form the third passages in the second substrate rather than in the first substrate, to obtain the predictable result of fluidly connecting the plurality of first passages and the plurality of second passages formed in the first substrate.

In regards to Claims 3, 22, and 30, the combination of Tu et al. and Hosogai et al. discussed above does not expressly teach that third passages are formed by orientation-dependent etching.

However, Tu et al. teaches that the second substrate 101 is a wafer. (Column 9, Line 66 - Column 10, Line 4)

Hosogai et al. additionally teaches that the second substrate 5 in which the third passages 8 are formed is a wafer (Paragraph 2), and that orientation-dependent etching

Art Unit: 1763

(*anisotropic etching*) is suitable for formation of separate rectangular recesses in a wafer (Paragraph 3).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the method taught by the combination of Tu et al. and Hosogai et al. as discussed above to form the third passages by orientation-dependent etching directly into the surface of the base second substrate, since, as taught by Hosogai et al. (Paragraph 3), such a process can form rectangular recesses with precision.

Response to Arguments

6. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection made in view of the amendment to the claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1763

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Maureen G. Arancibia
Patent Examiner
Art Unit 1763



Parviz Hassanzadeh
Supervisory Patent Examiner
Art Unit 1763